PROJECT SUMMARY

SNC Reference Number (for SNC use only)

SNC 080130

County: Tuolumne

Applicant: US Department of Agriculture, Forest Service Pacific Southwest Research Station

Project Title: Quantifying eighty years of change at the Stanislaus-Tuolumne Experimental Forest: Implications for restoring biodiversity and resilience to fire in the Sierra Nevada

PROJECT GOAL

The overall goal of this project is to develop a detailed description of the historical attributes of the mixed-conifer Sierran forest type prior to substantial disturbance modifications and to quantify the spatial changes in forest structure (trees, regeneration, gaps, shrub cover, coarse woody debris, herbaceous cover) after eighty years without fire or other disturbance.

PROJECT SCOPE

A great deal of effort is currently underway to restore forests of the Sierra Nevada to a more fire-resilient and ecologically diverse state through thinning and prescribed fire treatments. However, historical data on overstory spatial structure and understory composition, showing what a restored forest might look like, are lacking. Maps of three 10 acre plots on the Stanislaus-Tuolumne Experimental Forest, located near Pinecrest, CA were recently rediscovered and provide an opportunity to refine restoration targets. These maps, unique in their detail and large extent, show the location and species of all trees prior to any logging in 1929. In addition, the cover of understory shrubs, patches of tree regeneration, and logs on the ground were all mapped and herbaceous vegetation composition was recorded along transects. Plots were then logged with three different methods of cutting and left undisturbed since. Data associated with these plots (tree diameters, heights, etc.), plus images from photopoints, were located in the National Archives, in San Bruno, CA. The maps show that the forest was patchy and consisted of tree groups of different sizes, but relatively even-sized within groups. Tree regeneration was mostly confined to the numerous gaps, and understory vegetation was abundant. This heterogeneous structure was not only very diverse with high-quality habitat for wildlife, but also resilient to the numerous wildfires that historically burned through the Sierra. The purpose of this proposed project is to collect new information within these plots to quantify how conditions have changed over the past 80 years, and to analyze the 1929 data set to improve restoration targets for contemporary forest management. We have begun remapping the trees in these three plots, and preliminary data indicate that the tree density is now considerably higher and understory vegetation much sparser than it was historically. We propose to extend the mapping to surface fuels and shrubs, and conduct analyses on all of the historical and modern data in order to: quantify changes in the structure, composition, and carbon storage over time, and using historical stand structure and information on the size and frequency of gaps as a model to develop thinning prescriptions that balance biodiversity and fire management needs. Information on historical forest structure will also be beneficial for managing sugar pine, a species whose long-term

presence is threatened by the introduced white pine blister rust. Currently, the light and understory environment that favor natural regeneration of this species over its competitors is not well understood. These products will fill important information gaps and will be valuable for restoring resilience and high quality habitat to mixed conifer forests throughout the west slope of the Sierra Nevada.

LETTERS OF SUPPORT

Susan Skalski, U.S. National Forest Supervisor, Stanislaus National Forest, U.S. Forest Service

SNC PROJECT DELIVERABLES AND SCHEDULE

DETAILED PROJECT DELIVERABLES	TIMELINE
Project Initiation	February 2009
Progress Report #1	July 2009
Progress Report #2	December 2009
Peer Reviewed Journal Article - Historic Stand Structure	January 2010
Progress Report #3	May 2010
Silvicultural Recommendations for Managers	June 2010
Field Visit: Discussion of Developed Restoration Structure	August 2010
Peer Reviewed Journal Article - Changes in Stand Structure after 80 years at Stanislaus Experimental Forest	October 2010
Peer Reviewed Journal Article - Carbon Storage and Fire Risk: The Balancing Act	November 2010
Final Report	December 2010

SNC PROJECT COSTS

PROJECT BUDGET CATEGORIES	TOTAL SNC FUNDING
Labor	$ 84,580
Travel	$ 8,220
Equipment	$ 3,500
Deliverables/Performance Measures	$ 4,500
Indirect Costs	$ 8,064
SNC GRANT TOTAL	**$108,864**